

Patent Claims

1. Liquid crystal display (LCD) of the In Plane Switching (IPS) mode comprising a switchable LC cell sandwiched between two polarisers, said LC cell comprising a layer of an LC medium between two plane parallel substrates at least one of which is transparent to incident light, wherein the LC molecules are reoriented by application of an electric field that has a major component substantially parallel to the substrates, characterized in that the LCD comprises
 - at least one first retardation film comprising optically uniaxial positive calamitic LC material and having an optical axis substantially parallel to the film plane (+A plate),
 - at least one first retardation film comprising optically uniaxial positive calamitic LC material and having an optical axis substantially perpendicular to the film plane (+C plate).
2. LCD according to claim 1, characterized in that it comprises one +A plate and one +C plate.
3. LCD according to claim 1 or 2, characterized in that the optical axis of the +A plate is parallel to the stretch axis of the polariser that is situated on the same side of the LC cell as the +A plate.
4. LCD according to at least one of claims 1 to 3, characterized in that the +A plate and/or +C plate comprise polymerised or crosslinked calamitic LC material.
5. LCD according to at least one of claims 1 to 4, characterized in that the +A plate comprises polymerised or crosslinked calamitic LC material with planar orientation.

6. LCD according to at least one of claims 1 to 5, characterized in that the +C plate comprises polymerised or crosslinked calamitic LC material with homeotropic orientation.

5 7. LCD according to at least one of claims 1 to 6, characterized in that the position of the individual components is selected from the following configurations 1 to 24

10	1)	P(90)	C	A(90)	LC(0)	P(0)
	2)	P(90)	A(0)	C	LC(0)	P(0)
	3)	P(90)	LC(0)	A(90)	C	P(0)
	4)	P(90)	LC(0)	A(0)	C	P(0)
	5)	P(90)	A(0)	LC(0)	C	P(0)
15	6)	P(90)	A(90)	LC(0)	C	P(0)
	7)	P(90)	A(90)	C	LC(90)	P(0)
	8)	P(90)	C	LC(0)	A(90)	P(0)
	9)	P(90)	LC(0)	C	A(90)	P(0)
20	10)	P(90)	C	A(0)	LC(90)	P(0)
	11)	P(90)	C	LC(0)	A(0)	P(0)
	12)	P(90)	LC(0)	C	A(0)	P(0)
	13)	P(90)	LC(90)	C	A(90)	P(0)
	14)	P(90)	C	A(0)	LC(90)	P(0)
25	15)	P(90)	LC(90)	A(0)	C	P(0)
	16)	P(90)	C	A(90)	LC(90)	P(0)
	17)	P(90)	C	LC(90)	A(90)	P(0)
	18)	P(90)	A(0)	C	LC(90)	P(0)
	19)	P(90)	LC(90)	A(90)	C	P(0)
30	20)	P(90)	A(0)	LC(90)	C	P(0)
	21)	P(90)	A(90)	LC(90)	C	P(0)
	22)	P(90)	A(90)	C	LC(90)	P(0)
	23)	P(90)	C	LC(90)	A(0)	P(0)
	24)	P(90)	LC(90)	C	A(0)	P(0)

35 wherein A is a +A plate, C is a +C plate, LC is the switchable LC cell of the display, and P is a linear polariser, and the numbers in

brackets denote the orientation angle (in degrees) of the optical axis of the +A and +C plate, the polarising direction of the polarisers P, or the preferred orientation direction of the LC molecules in the LC cell, respectively, in the direction parallel to the plane of the individual films or to the substrates of the LC cell.

5 8. LCD according to claim 7, characterized in that the position of the individual components is selected from the following configurations 1 to 8

10

1)	S	P(90)	C	S	A(90)	LC(0)	S	P(0)	S
2)	S	P(90)	S	C	A(90)	LC(0)	S	P(0)	S
3)	S	P(90)	S	LC(0)	A(0)	C	S	P(0)	S
4)	S	P(90)	S	LC(0)	A(0)	S	C	P(0)	S
5)	S	P(90)	S	LC(90)	A(0)	C	S	P(0)	S
6)	S	P(90)	S	LC(90)	A(0)	S	C	P(0)	S
7)	S	P(90)	S	C	A(90)	LC(90)	S	P(0)	S
8)	S	P(90)	C	S	A(90)	LC(90)	S	P(0)	S

20

wherein A, C, P, and LC have the meanings given in claim 8, and S denotes a transparent substrate.

25

9. LCD according to at least one of claims 1 to 8, characterized in that the the +A plate and +C plate are situated on the same side of the switchable LC cell.

10. LCD according to at least one of claims 1 to 6, characterized in that the +A plate and/or the +C plate are situated between the substrates of the LC cell.

30 11. Compensator comprising at least one +A plate and at least one +C plate as defined in at least one of claims 1 to 10, and optionally comprising at least one linear polariser.

35